

STAFF REPORT

LOCALIZED HEALTH IMPACTS REPORT

For Selected Projects Awarded Funding Through the
Alternative and Renewable Fuel and Vehicle Technology
Program Under Solicitation PON-11-609: Hydrogen Fuel
Infrastructure



CALIFORNIA
ENERGY COMMISSION
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CALIFORNIA ENERGY COMMISSION

Jean Baronas
Primary Author and Project Manager

Jim McKinney
Office Manager
Emerging Fuels and Technologies Office

Pat Perez
Deputy Director
Fuels and Transportation Division

Robert P. Oglesby
Executive Director

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Jacque Gilbreath
Andre Freeman
Eric Law
Pilar Magana
Tobias Muench
Charles Smith
Fui Thong
Eric VanWinkle

PREFACE

The increased use of alternative and renewable fuels supports California's commitment to curb greenhouse gas emissions (GHG), reduce petroleum use, improve air quality, and stimulate the sustainable production and use of such fuels within California. Alternative and renewable transportation fuels include electricity, natural gas, biomethane, propane, hydrogen, ethanol, renewable diesel, and biodiesel. State investment is needed to fill the gap and fund the differential cost of these emerging fuels and vehicle technologies.

Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007) created the Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP). This statute, amended by Assembly Bill 109 (Núñez, Chapter 313, Statutes of 2008), authorizes the California Energy Commission to “develop and deploy innovative technologies that transform California's fuel and vehicle types to help attain the state's climate change policies.”

The statute also directs the California Air Resources Board (ARB) to develop guidelines to ensure air quality improvements. The ARB Air Quality Improvement Program (AQIP) Guidelines, approved in 2008, are published in the *California Code of Regulations, Title 13, Motor Vehicles, Chapter 8.1, AB 118 Air Quality Guidelines for the Alternative and Renewable Fuel and Vehicle Technology Program and the AQIP*. The *AQIP Guidelines* require the Energy Commission, as the funding agency, to analyze the localized health impacts of ARFVTP-funded projects that require a permit (13 CCR § 2343).

The Energy Commission received proposals in response to Program Opportunity Notice (PON) -11-609 for hydrogen fuel infrastructure and is considering approving and funding the projects described in this *LHI Report*. This report contains the project and site descriptions (including geographic locations), potential impacts and benefits, and outreach efforts as declared by the proposers in their documentation. No potential exists for adverse health effects from the nominal increase in criteria emissions from the proposed projects.

ABSTRACT

California Code of Regulations, Title 13, Motor Vehicles, Chapter 8.1, § 2343(c)(6), requires the California Energy Commission to consider the localized health impacts when selecting projects for funding. For each funding cycle, the Energy Commission is required to analyze localized health impacts for projects proposed for program funding that require a permit.

This *LHI Report* reviews the project proposals under consideration for funding that were submitted in response to the Hydrogen Fuel Infrastructure Grant Solicitation (PON-11-609) by the Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP). This *Localized Health Impacts Report* contains project and site descriptions (including geographic locations), potential impacts, and outreach efforts as contained in the proposals.

This *LHI Report* analyzes the aggregated locations of projects, the impacts in communities with the most significant exposure to air contaminants or localized air contaminants, or both, including but not limited to, communities of minority populations or low-income populations, as declared by the project proposers or also as determined by Energy Commission staff. This Report identifies outreach to community groups and other affected stakeholders, also as declared by the project proposers.

Keywords: Assembly Bill (AB) 118, air quality, air quality improvement program (AQIP), alternative fuel, California Energy Commission, criteria emissions, environmental justice (EJ), greenhouse gas emissions, hydrogen, and localized health impacts (LHI)

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EXECUTIVE SUMMARY

Under the *California Code of Regulations Title 13, (CCR § 2343)*, this *Localized Health Impacts (LHI) Report* describes the hydrogen fuel infrastructure projects proposed for Alternative and Renewable Fuels and Vehicle Technology Program (ARVTP) funding that may or may not require a conditioned or discretionary permit or environmental review, such as conditional use permits, air quality permits, wastewater permits, hazardous waste disposal permits, and other land use entitlements. This report does not include projects requiring only residential building permits, mechanical/electrical permits, or fire/workplace safety permits, as these are determined to have no likely impact on the environment.

The California Energy Commission is required to assess the localized health impacts of the projects proposed for ARVTP funding under Hydrogen Fuels Infrastructure PON-11-609. This *LHI Report* focuses on the potential impacts the projects may or may not have on a particular community, particularly those communities that are considered especially vulnerable to emissions increases within their community. For projects located in high-risk communities, this report assesses the impacts from criteria emissions/air toxics, the air quality attainment status, and mitigation plans, if available. This *LHI Report* includes information about the proposer's outreach efforts including public notices and community outreach.

Environmental justice communities, low-income communities, and minority communities are considered to be the most impacted by any project that could result in increased criteria and toxic air pollutants within an area because these communities typically have the most significant exposure to the emissions. Assessing these projects and the communities surrounding them is important because of the health risks associated with these pollutants. Preventing health issues from air pollution in any community is important, but it is especially important to minimize any negative impacts in communities that are already considered to be at risk due to their continued exposure to these contaminants.

The projects in this *LHI Report* are assessed for health impacts for the communities in which they could be potentially located; they vary in terms of socioeconomic factors. No additional criteria pollutants would be associated with the proposed projects nor does the potential exist for adverse health effects from the nominal increase in criteria emissions from the proposed projects.

Based on this analysis, it is not anticipated that the implementation of the projects will have negative impacts on surrounding communities because there will not be a net increase in criteria and toxic emissions. Potentially, the projects stand to provide improved quality of life through cleaner air because fuel cell vehicles emit no tailpipe emissions.

CHAPTER 1:

Assessment Approach and Definitions

The California Energy Commission, through the Alternative and Renewable Fuels and Vehicle Technology Program (ARFVTP), released a competitive Grant Solicitation and Application Package on February 9, 2012. The application due date was March 22, 2012. Grant Solicitation Program Opportunity Notice 11-609 sought to fund projects that expand the network of public retail and public-private fleet-based hydrogen fueling stations to serve the current population of fuel cell vehicles (FCVs) and to accommodate the planned large-scale rollout of FCVs commencing in 2015.

The Energy Commission is required to analyze and publish this *LHI Report* for public review and comment for a period of 30 days. Based on the Energy Commission's interpretation of the Air Quality Improvement Program (AQIP) Guidelines, this *LHI Report* provides information about the communities surrounding the potential project sites and assesses the potential impacts to public health in those communities as a result of the proposed projects. This report is prepared under the *California ARB AQIP Guidelines, California Code of Regulations, Title 13, Motor Vehicles, Chapter 8.1 (CCR § 2343)*:

“(6) Localized health impacts must be considered when selecting projects for funding. The funding agency must consider environmental justice consistent with state law and complete the following:

(A) For each fiscal year, the funding agency must publish a staff report for review and comment by the public at least 30 calendar days prior to approval of projects. The report must analyze the aggregate locations of the funded projects, analyze the impacts in communities with the most significant exposure to air contaminants or localized air contaminants, or both, including, but not limited to, communities of minority populations or low-income populations, and identify agency outreach to community groups and other affected stakeholders.

(B) Projects must be selected and approved for funding in a publicly noticed meeting.”

This *LHI Report* is not intended to be a detailed environmental health or impact analysis of projects potentially to be funded by the program nor is this assessment intended to be a substitute for the comprehensive environmental review conducted by regulatory agencies during the California Environmental Quality Act (CEQA) process. The application of CEQA would provide a more detailed analysis of the potential for adverse environmental effects of the proposed projects.

This report collects available information about the potential air quality impacts of the proposed projects and provides a collective, narrative analysis of the potential for localized health effects from those projects. The AQIP Guidelines mandate that the Energy Commission track the projects' progress through the CEQA process and ensure a commitment exists from the proposers to complete all mitigation measures required by the permitting agency before they receive the first funding allocation.

Staff reviewed results from the Environmental Justice Screening Method (EJSM) to identify projects located in areas with social vulnerability indicators and the greatest exposure to air pollution and associated health risks.¹ The EJSM was developed to identify low-income communities highly affected by air pollution for assessing the impacts of climate change regulations, specifically Assembly Bill 32 (Núñez/Pavley, Chapter 488, Statutes of 2006), the California Global Warming Solutions Act of 2006.

The EJSM identifies the various levels of risk in regions throughout California, and high-risk communities are considered especially vulnerable to even the smallest impacts. The EJSM integrates data on exposure to air pollution, cancer risk, ozone concentration and frequency of high ozone days, race/ethnicity, poverty level, home ownership, median household value, educational attainment, and sensitive populations (populations under 5 years of age, or over 65 years of age).

The ARB applied the method to the San Francisco Bay Area, San Joaquin Valley, and California's desert region. However, the results consider only income among the list of social vulnerability indicators. For communities not yet assessed in the EJSM, the Energy Commission identifies high-risk areas as those in nonattainment basins for ozone, particle pollution, or particulate matter (PM) 2.5 and PM 10, along with populations that have high poverty and minority rates as well as a high percentage of sensitive populations.

This *LHI Report* contains detailed assessments for projects that are located in a low-income community that is highly impacted by air pollution. The reason this *LHI Report* contains detailed assessment for these communities is that the populations within these communities are presumed to be most susceptible to health risks because of their exposure to criteria and toxic air pollutants on a more continual basis as compared with other geographic regions.

Permits

For this assessment, the Energy Commission interprets "permits" to connote discretionary and conditional use permits because they require a review of potential impacts to a community and the environment before issuance. For air permits, local air districts conduct a New Source

1 California Air Resources Board (ARB), *Air Pollution and Environmental Justice, Integrating Indicators of Cumulative Impact and Socio-Economic Vulnerability Into Regulatory Decision-Making*, 2010. (Sacramento, California) Contract authors: Manuel Pastor Jr., Ph.D., Rachel Morello-Frosch, Ph.D., and James Sadd, Ph.D.

Review (NSR) to determine the emission impacts. Since ministerial-level permits, such as building permits, do not assess public health-related pollutants, Energy Commission staff does not assess projects requiring only ministerial level permits in this report. An overview of the permit requirements for identified projects potentially to be located in at risk communities is included in the project overviews in this *LHI Report*.

Incremental increases in criteria emissions must be reduced or mitigated through a pollution control standard known as Best Available Control Technologies (BACT), and possibly, Emission Reduction Credits (ERC), which are generally credits granted upon request by an emission source. An NSR determines if a modification to an existing station or construction of a new station will result in significant increased air emissions within a given region, and this report contains the related information as given by the project proposers. Immediate action must be taken by the appropriate party for any toxics released that exceed predetermined thresholds before a facility is reconsidered for a permit. An overview of the permit requirements for identified projects potentially to be located in high-risk communities is included in the project overviews in this *LHI Report*.

Demographic Data

Demographic data for the planned site locations are provided in this report. Staff collected information on ethnicity, age, and income for the city/community where the potential project, if funded, would be located. The information identifies those communities with higher minority populations, lower incomes, and highly sensitive groups based on age. For this assessment, staff identifies sensitive populations as individuals younger than 5 years of age and older than 65 years of age.

Emissions

Staff collected information about the predicted emissions contained in the project proposals. These include hydrogen production, the automation of a hydrogen fill system that fills trailer trucks for hydrogen transport to dispensing stations, and the hydrogen dispensing stations themselves. As proposed, the hydrogen fuel infrastructure will increase the use of hydrogen in the place of petroleum. The infrastructure's components will produce small amounts of CO₂ and water emissions. The carbon dioxide (CO₂) emissions will come from electricity generation; electricity runs the compressors. The CO₂, however, would be emitted at the site of electricity generation. The estimated emissions are included in most of the project descriptions in this *LHI Report*.

As fuel cell vehicles enter the market and begin to displace gasoline and diesel vehicles, tailpipe pollutants will be eliminated. Hydrogen supply and use in fuel cell vehicles (FCVs) would reduce emissions to 154 grams CO₂/mile traveled or 65 percent lower than the Low Carbon Fuel Standard (LCFS) 2011 gasoline baseline. There will be zero tailpipe emissions from FCVs.

Community Status and Project Overviews

The following community status and overview of the proposed projects are based on the ARB *Proposed Screening Method*, which integrates data to identify low-income communities that are highly impacted by air pollution.² The *California State Implementation Plans* (<http://www.arb.ca.gov/planning/sip/sip.htm>) are used as a source for public notices for attainment plans. The *Green Book Nonattainment Areas for Criteria Pollutants* (<http://www.epa.gov/oaqps001/greenbk>) is also used as an information source for this assessment.

The following table summarizes the findings of the project assessment. For high-risk communities/cities, more detail is provided in the following chapters. Staff identifies high-risk communities/cities using the following factors: (1) those located in nonattainment air basins for ozone, PM 2.5, and/or PM 10, (2) those located in communities with high poverty, minority, and/or unemployment rates, and (3) those located in communities with a high percentage of sensitive populations (under 5 years of age or over 65 years of age).

All of the proposed projects would be located in nonattainment zones for ozone, PM 2.5, and PM 10. As shown in the following table, two projects would also be in high-risk (low-income) communities. Those in high-risk communities are projects proposed for Beverly Hills, Huntington Beach, and Wilmington. The sensitive populations are environmental justice (EJ) indicators described later in this report.

Table 1: Community Status and Project Overviews

Project/Station	High-Risk Community	CEQA Completed	Air District Permit Status	Attainment Status for Ozone, Particulate Matter (PM) 2.5, PM 10
Linde, LLC				
Cupertino Station	No	In progress	In progress	Nonattainment (all)
Mountain View Station	No	In progress	In progress	Nonattainment (all)
Hydrogen Frontier				
Lake Forest Station	No	In progress	In progress	Nonattainment (all)
Agoura Hills Station	No	In progress	In progress	Nonattainment (all)
Huntington Beach (Main Street) Station	No	In progress	In progress	Nonattainment (all)

² California Air Resources Board (ARB), *Proposed Screening Method for Low-Income Communities Highly Impacted by Air Pollution*, 2010 (Sacramento, California).

Project/Station	High-Risk Community	CEQA Completed	Air District Permit Status	Attainment Status for Ozone, Particulate Matter (PM) 2.5, PM 10
Air Products and Chemicals				
Beverly Hills Station	Yes	In progress	In progress	Nonattainment (all)
Lake Forest Station	No	In progress	In progress	Nonattainment (all)
Huntington Beach Station	Yes	In progress	In progress	Nonattainment (all)
Agoura Hills Station	No	In progress	In progress	Nonattainment (all)
Manhattan Beach Station	No	In progress	In progress	Nonattainment (all)
Wilmington Centralized Fill Automation System	Yes	In progress	In progress	Nonattainment (all)

Source: Energy Commission staff analysis

CHAPTER 2:

Projects Proposed for Funding

This chapter summarizes the projects proposed for Energy Commission funding. The overviews include a project and site descriptions and potential health impacts related to air pollutants. Outreach efforts are also included. The Energy Commission staff plans to present the proposed projects for approval at business meetings (subject to the Warren-Alquist Open Meeting Act), upon receipt of the appropriate CEQA documentation in 2012.

The projects in this *LHI Report* are:

- A. Linde LLC's "Hydrogen Fueling Stations"
 - 1. Cupertino Station
 - 2. Mountain View Station
- B. Hydrogen Frontier's "Hydrogen Fueling Stations"
 - 1. Huntington Beach Station on Main Street
 - 2. Lake Forest Hydrogen Station
- C. Air Products and Chemicals, Inc.'s "Centralized Hydrogen Fill System" and "Low Cost Hydrogen Fueling Stations"
 - 1. Wilmington Fill System
 - 2. Beverly Hills Station
 - 3. Lake Forest Station
 - 4. Huntington Beach Station
 - 5. Agoura Hills Station
 - 6. Manhattan Beach Station

2-A. Project Name: Linde, LLC's, "Hydrogen Fueling Stations"

Linde LLC ("Linde") proposes hydrogen fueling stations at existing retail gasoline stations in Cupertino and Mountain View. The proposed modular designs have a minimal footprint to fit into the gasoline station layout.

Cupertino Station

Linde proposes a hydrogen fueling station to be located at 21530 Stevens Creek Boulevard, Cupertino, California, at an existing 76 gasoline station that has a small convenience store and maintenance shop. The site is in a commercial area with businesses, restaurants, and a medical center. It is near the State Route 85 and Interstate 280.

Mountain View Station

Linde proposes a hydrogen fueling station to be located at 830 Leong Drive, Mountain View, California at an existing “Flyers” (Formerly ARCO®) gasoline station, which is undergoing renovation. The renovation is permitted and approved. The existing station has a small convenience store and maintenance shop. The site is in a residential neighborhood near State Route 85 and U.S. Highway 101.

Emissions for the Cupertino and Mountain View Stations

The proposer does not foresee this project adding criteria pollutants and toxic air contaminants to the localized air shed for any of the three stations. Nor do they predict impacts on ambient air quality levels to an extent that the local community’s health would be adversely impacted. The hydrogen would be stored in environmentally benign tanks and the compression system would operate using cooling systems for self-containment. Additionally, the proposer’s compressor technology yields improved power use and maintenance intervals.

The proposer estimates that each station would result in total carbon reductions (metric tons GHG 2014-2016) equal to 1,872 metric tons. The proposer also estimates that each station would result in total carbon reductions (metric tons GHG 2014-2023) equal to 16,216 metric tons. The displaced petroleum for each station (Cupertino and Mountain View) is 346,153 gallons from 2014 – 2016.

The proposed stations must adhere to federal safety standards and feature many safety components to ensure that the community and station users are safe. The Bay Area Air Quality Management District (AQMD) has experience in issuing permits for hydrogen fill stations and will ensure that Linde and these proposed stations comply with all federal, state, and air district standards to guarantee the safety and health of all surrounding communities.

Outreach

The proposer would provide station tours and distribute its related educational material along with material from the Fuel Cell and Hydrogen Energy Association (FCHEA) and original equipment manufacturer (OEM) partners. It would continue outreach and promotion through contacts from past leadership positions; a team member has served as chairman of the National Hydrogen Association.

The company plans to continue outreach activities such as those in the past. In 2010, Linde sponsored the Sacramento State House Ride and Drive event and in the following year, it partnered with Daimler for the World Drive event in which three Daimler fuel cell vehicles (FCVs) were demonstrated traveling with a Linde hydrogen fueling system. It also plans to organize press releases for the station openings.

Linde plans to work with Pearson Fuels of San Diego, the California Fuel Cell Partnership, and OEMs to coordinate participation with local agencies and advocacy groups. Other public outreach would include grassroots (neighborhoods, car clubs), social media, and print/TV/radio, and press conferences.

2-B. Project Name: Hydrogen Frontier’s “Hydrogen Fueling Stations”

Hydrogen Frontier proposes adding hydrogen dispensers to two existing gasoline stations in Huntington Beach and Lake Forest.

Huntington Beach Station at Main Street

The site proposed for one of the Huntington Beach hydrogen fueling stations would be at an existing gas station located at 18472 Main Street, Huntington Beach. The proposed location is in a commercial zone on a major street that connects to Interstate 405 and the Pacific Coast Highway.

Lake Forest Station

Hydrogen Frontier also proposes a hydrogen fueling station at a gas station currently operating at 20572 Lake Forest Drive, Lake Forest. The site is in a commercial zone and on a street that connects two freeways.

Emissions for Huntington Beach and Lake Forest Stations

The proposer would use hydrogen provided by Praxair. Praxair proposes providing hydrogen derived from the by-product of chlor-alkali production which --- according to the proposer --- is a non-fossil feedstock. The power generated for the related process would come from the hydro-electric facility at Niagara Falls, operated by the New York Power Authority. Praxair has confirmed in their letter of support that accompanies the Hydrogen Frontier proposal that they will internally document the allocation of a portion of its renewable hydrogen production credits at Niagara Falls to an amount that corresponds to 100% of the hydrogen supplied to the hydrogen fueling stations from Praxair’s Ontario, California facility.

The environmental impact from transporting hydrogen from that source to the stations would be the largest impact but this impact would be offset due to the creation of hydrogen from these renewable energy resources; this environmental impact is expected to be minimal. The proposed dispensing stations would generate some direct and indirect CO₂ emissions.

The proposed hydrogen fueling stations must adhere to federal standards for safety. The South Coast Air Quality Management District has experience in issuing permits for hydrogen fueling stations and will ensure that Hydrogen Frontier and their proposed stations comply with all federal, state, and air district standards to guarantee the safety and health of all surrounding communities.

Outreach

The proposer plans to continue the outreach and training activities as they have in the past. Working with their partner, Powertech, Hydrogen Frontier plans to provide station tours for local residents, colleges and universities, and OEM vehicle customers.

2-C. Project Name: Air Products and Chemicals, Inc.'s "Low Cost Hydrogen Fueling Stations and Central Fill System

The proposer, Air Products and Chemicals, Inc., would transport hydrogen from a centralized fill system in Wilmington, using high pressure trailers designed for the job. Air Products and Chemicals, Inc. also proposes to install eight hydrogen fueling stations in the greater Los Angeles area. The proposed installations would further develop the network of hydrogen fueling stations started under Energy Commission Grant Agreement ARV-10-048. The proposed stations would each dispense up to 180 kg/day of hydrogen. The following table lists the proposed locations for the fill system automation and the fueling stations.

Table 2: Air Product's Proposed Hydrogen Fill System and Fueling Stations

Location	Facility	Site
Wilmington Fill System		
700 Henry Ford Avenue, Wilmington CA 90744	Fill system at the Air Products Hydrogen Production Facility (Capacity=180kg for each of the following hydrogen fueling stations)	Industrial area; a 10-foot-by-10-foot foundation plus additional trenching would be constructed within the facility. The founding/trenching would be used for tubing and electrical connections would be installed.
Beverly Hills Station		
9988 Wilshire Blvd., Beverly Hills, CA 90210	76® existing gasoline fueling station	The station would be adjacent to golf course and closed department store.
Lake Forest Station		
23652 Rockfield Blvd., Lake Forest, CA 92630	Shell® existing gasoline fueling station	The station would be adjacent to a motel.
Huntington Beach Station		
16001 Beach Blvd., Huntington Beach, CA 92647	Mobil® existing gasoline fueling station	The station located in a busy commercial area.
Agoura Hills Station		
5221 Palo Camado Canyon Road, Agoura Hills, CA 91301	Chevron® existing gasoline fueling station	The station would be adjacent to an office building.

Location	Facility	Site
Manhattan Beach Station		
1865 Manhattan Beach Blvd., Manhattan Beach, CA 90266	Mobil® existing gasoline fueling station	The city recreation department is located across the street

Source: Air Products response to PON-11-609

Emissions

The proposed projects would generate direct and indirect emissions from the production and distribution of hydrogen and from power consumption at the hydrogen fueling stations. Hydrogen would be produced at the fill station located in Wilmington; the Wilmington hydrogen production plant includes coproduction of steam and electricity.

According to the proposer, in serving the demand of the Southern California market, an incremental increase in the amount of hydrogen produced at the Wilmington centralized fill system would be realized. The Wilmington operation would result in the following incremental increase in total emissions; CO₂, oxides of nitrogen (NO_x), sulfur oxide (SO_x), reactive organic gas (ROG), carbon monoxide (CO), PM₁₀, and anhydrous ammonia (NH₃). Although any amount of hydrogen production has associated emissions, the emissions from the Wilmington facility would not substantively increase as a result of this project as shown in the following table.

Table 3: Air Product's Wilmington Centralized Fill System Projected Incremental Increase in Total Emissions as a Result of Hydrogen Production

0.0012 lbs NO _x /kg H ₂
0.0005 lbs SO _x /kg H ₂
0.0006 lbs ROG/kg H ₂
0.0033 lbs CO/kg H ₂
0.0017 lbs PM/kg H ₂

Source: Air Products response to PON-11-609

The environmental impact from transporting hydrogen from the Wilmington centralized fill system would be minimal due to the proximity of the proposed hydrogen fueling stations. The emissions resulting from the transport from Wilmington to the stations includes NO_x emissions averaging 3.8 grams per mile and ROG emissions averaging 0.13 grams per mile.

The initial operation is estimated to increase customer FCV traffic at each station by six to seven cars daily, in addition to increased delivery traffic of four trucks per month. Over the long term, the proposer estimates an increase in customer traffic by 30 to 40 cars per day and an

increase in delivery traffic by one truck per day. The proposer expects one truck to make a delivery run to three stations (based on expected demand in 2014), daily. For its assessment, the proposer uses these delivery routes for (1) Agoura Hills/Beverly Hills and (2) Huntington Beach/Lake Forest.

The proposed project is developed to the objectives and goals contained in California's LCFS and satisfy (and, for this project, exceed) the 33.3 percent renewable energy requirements for hydrogen use as a transportation fuel. The proposer notes that, given the ease of expansion of the stations, significant reductions in GHG may be anticipated based on the deployment plans for FCVs into the California market. Based on Energy Commission funding and expected reductions in GHG emissions and petroleum from 2013 to 2020, it is estimated that the proposed nine stations (with anticipated ramp up that doubles output) would dispense 400 kg/day resulting in 37.0 metric tons of GHG reduction (for all nine stations). This equates to 600 gallons of petroleum displaced.

On a full-life cycle basis hydrogen supply and use in the FCVs will reduce emissions to 46 grams CO₂/mile travelled or 88 percent lower than the LCFS 2012 gasoline baseline. In the course of their travel, there will be zero emissions from the FCVs. Overall, in comparison to gasoline, this project will provide an improvement to air quality levels in the operating area.

No potential exists for adverse health effects from the nominal increase in criteria emissions from the proposed projects. Each site will require permits from local authorities before construction; Air Products and its subcontractors will work with the permitting agencies to provide the proper notification and communication to residents in the immediate area of activity. The stations must adhere to federal safety standards and features many safety components to ensure that the community and station users are safe. All of the proposed stations would be in the South Coast Air Quality Management District (SCAQMD). The Air District has experience in issuing permits for hydrogen fill stations and will ensure that Air Products and these proposed stations comply with all federal, state, and air district standards to guarantee the safety and health of all surrounding communities.

Outreach

The SCAQMD will post notices to the Air Resources Board and Environmental Protection Agency websites and in local newspapers if the project is using emission offsets or emission reduction credits. The proposer plans outreach associated with informing the public about the use and availability of the stations.

CHAPTER 3:

Aggregate Location Analysis and Community Impacts

Based on the staff's assessment of the proposed projects, it is expected that none of the surrounding communities would be disproportionately impacted by the implementation of the projects. For this *LHI Report*, environmental justice (EJ) indicators are evaluated as follows.

- A minority EJ is indicated if a minority subset represents more than 30 percent of a given city's population.
- A poverty level EJ is indicated if a city's poverty level exceeds the state of California's poverty level. California's poverty level is 13.7 percent.
- An unemployment EJ is indicated if a given city's unemployment rate exceeds the state of California's unemployment rate. California's unemployment rate is 10.9 percent, as of February, 2012.
- An EJ age indicator is also noted for cities where the percentage of persons younger than 5 years of age or older than 65 years of age is 20 percent higher than the average of the percentage of persons under 5 years of age or over 65 years of age for the entire state. (For the entire state, the percentage of persons under the age of 5 years is 6.8 percent, and the percentage of persons over the age of 65 years is 11.4 percent.) For this assessment, staff uses for the persons under the age of 5 years, a factor of 8.2. For this assessment, staff also uses for persons over the age of 65 years, a factor of 13.7.

The cities and EJ indicators follow. While EJ indicators exist, the proposed projects are expected to have a net benefit by reducing emissions and leading to improved air quality in these communities. While overall air quality depends on a number of factors, the Energy Commission expects that air quality will improve over time in disadvantaged communities and in those with the most significant exposure to air pollutants.

This assessment shows that the minority populations in the various locations approach the minority EJ indicator. This assessment shows that an EJ indicator exists for age (persons older than 65 years) in Huntington Beach and Beverly Hills. The unemployment rate in Wilmington significantly exceeds the average unemployment rate in California.

Table 4: Cities With Environmental Justice Indicators

City	Minority	Poverty Level	Unemployment Rate	Persons Under 5 Years of Age	Persons over 65 Years of Age
Huntington Beach					X
Beverly Hills					X
Wilmington			X		

Source: Energy Commission staff analysis

The following table shows demographics in the communities/cities where proposed projects, if funded, would be located.

Table 5: Demographic Data⁴
(Numbers in Percent With the Exception of Populations)

2010 Data	Per-sons Below Pov-erty Level	Black per-sons	American Indian and Alaska Native	Per-sons of Hispanic or Latino Origin	White per-sons	Persons under 5 years of age	Persons over 65 years of age	Unemploy-ment rate⁵
Cupertino Population = 58,302	4.6	0.6	0.2	3.6	31.3	5.4	12.5	4.5
Mountain View Population = 74,066	7.1	2.2	0.5	21.7	56.0	7.1	10.6	7.7
Lake Forest Population =77,264	5.3	1.7	0.5	24.6	70.3	6.3	9.2	6.3
Agoura Hills Population = 20,330	4.0	1.3	0.3	9.5	84.3	4.4	11.3	5.4

³ <http://www.labormarketinfo.edd.ca.gov/Content.asp?pageid=133>
and <http://www.bls.gov/eag/eag.ca.htm>

⁴ <http://quickfacts.census.gov>

⁵ <http://www.labormarketinfo.edd.ca.gov/Content.asp?pageid=133>

2010 Data	Per- sons Below Pov- erty Level	Black per- sons	American Indian and Alaska Native	Per-sons of Hispanic or Latino Origin	White per- sons	Persons under 5 years of age	Persons over 65 years of age	Unemploy- ment rate⁵
Huntington Beach Population = 189,992	4.0	1.0	0.5	17.1	76.7	5.1	14.2	7.4
Beverly Hills Population = 34,109	7.9	2.2	0.1	5.7	78.6	3.8	19.1	8.5
Redondo Beach Population = 66,748	5.5	2.8	0.4	15.2	65.2	6.3	19.3	6.5
W. Holly- wood Population = 34,399	13.2	3.2	0.3	10.5	84.2	1.9	14.9	10.3
Pasadena Station Population = 137,122	13.2	3.2	0.3	10.5	84.2	1.9	13.5	9.3
Manhattan Beach Station Population = 35,135	3.0	0.8	0.2	6.9	84.5	5.8	12.7	4.3
Wilmington Centralized Fill System Population = 54,000 (estimate)	3.8	3.8	1.2	7.6	3.7	6.2	5.8	13.40
California Population = 37,253,956 (2006 – 2010)	13.7 (2006 – 2010)	6.2 (2010)	1.0 (2010)	37.6 (2010)	57.6 (2010)	6.8 (2010)	11.4 (2010)	10.9 (2010)

Source: California Energy Commission staff assessment

CHAPTER 4:

Summary

For an overview, the following table combines the EJ indicators, demographics, and potential impacts in terms of convenience, accessibility, and emissions. In summary, staff concludes that the proposed projects, if funded, would reduce emissions, exposure, and health risk at a local level, based on the assumption that the vehicles deployed and operated with said projects are cleaner than the gasoline vehicles they are likely to replace.

The proposed hydrogen fuel infrastructure will increase the widespread use of alternative fuel vehicles in place of their petroleum counterparts. Notably, there are no criteria emissions or toxic air pollutants associated with either dispensing or using hydrogen in a vehicle. As fuel cell vehicles (FCVs) enter the market and begin to displace gasoline and diesel vehicles, tailpipe pollutants stand to be eliminated.

Small amounts of indirect carbon dioxide and direct water emissions may or may not occur through onsite compression, storage, and dispensing of the hydrogen. Indirect CO₂ emissions come from the use of electricity for the onsite compressors. Such compressors use electricity from the grid. The electricity that is used by the compressors is generated offsite; therefore, the associated emissions do not affect the communities in which the stations are located. Should fueling stations generate electricity locally, through renewable energy resources, the CO₂ emissions are not considered an indirect emission.

The conclusion that the anticipated potential impacts are positive to the communities is explained below. This is true even for those communities that are described as low income; those would be highly impacted by air pollution, and also those with EJ indicators.

Table 6: Facility, Location, and Community Impacts

Project	Proposer/project location	Community	Anticipated Potential Impact (brief summaries based on details in the proposed project descriptions)
2-A	Linde LLC, Cupertino, 21530 Stevens Creek Bl., Cupertino, CA 95014	This project would not be in a low-income community that is highly impacted by air pollution. ⁶ The city has no EJ indicators.	Convenience and accessibility to fueling at retail gas fueling station. No emissions from in hydrogen fueled vehicles.
2-A	Linde LLC, 830	This project would not	Convenience and accessibility to

⁶ *Proposed Screening Method for Low-Income Communities Highly Impacted by Air Pollution*. California Air Resources Board (ARB). 2010.

Project	Proposer/project location	Community	Anticipated Potential Impact (brief summaries based on details in the proposed project descriptions)
	Leong Drive, Mountain View, CA 94043	be in a low-income community that is highly impacted by air pollution. ⁷ The city has no EJ indicators.	fueling at retail gas fueling station. No emissions from hydrogen fueled vehicles.
2-B	Hydrogen Frontier, 20572 Lake Forest Dr., Lake Forest, CA 92630	This project would not be in a low-income community that is highly impacted by air pollution. ⁸ The city has no EJ indicators.	Convenience and accessibility to fueling at retail gas fueling station. No emissions from hydrogen fueled vehicles.
2-B	Hydrogen Frontier, 18472 Main Street, Huntington Beach, CA 92647	This community has 1 EJ indicator.	Convenience and accessibility to fueling at retail gas fueling station. No emissions from hydrogen fueled vehicles.
2-C	Air Products and Chemicals, LLC , 9988 Wilshire Blvd., Beverly Hills CA 90210	The city has 1 EJ indicator.	Convenience and accessibility to fueling at retail gas fueling station. No emissions in hydrogen fueled vehicles.
2-C	Air Products and Chemicals, LLC, 23652 Rockfield Blvd., Lake Forest CA 92630	This project would not be in a low-income community that is highly impacted by air pollution. ⁹ The city has no EJ indicators.	Convenience and accessibility to fueling at retail gas fueling station. No emissions in hydrogen fueled vehicles.
2-C	Air Products and Chemicals, 16001 Beach Blvd., Huntington Beach CA 92647	The city has 1 EJ indicator.	Convenience and accessibility to fueling at retail gas fueling station. No emissions in hydrogen fueled vehicles.
2-C	Air Products and Chemicals, 5221 Palo Camado	This project would not be in a low-income community that is highly	Convenience and accessibility to fueling at retail gas fueling station. No emissions in hydrogen fueled

⁷ Ibid.

⁸ Ibid.

⁹ Ibid.

Project	Proposer/project location	Community	Anticipated Potential Impact (brief summaries based on details in the proposed project descriptions)
	Canyon Rd., Agoura Hills CA 91301	impacted by air pollution. ¹⁰ The city has no EJ indicators.	vehicles.
2-C	Air Products and Chemicals, 1865 Manhattan Beach Bl., Manhattan Beach, CA 90266	This project would not be in a low-income community that is highly impacted by air pollution. ¹¹ The city has no EJ indicators.	Convenience and accessibility to fueling at retail gas fueling station. No emissions from hydrogen fueled vehicles.
2-C	Air Products and Chemicals, 700 Henry Ford Avenue, Wilmington, CA 90744	The city has 1 EJ indicator.	Centrally located filling system would supply the various fueling stations.

Source: California Energy Commission staff assessment

¹⁰ *Ibid.*

¹¹ *Ibid.*

CHAPTER 5:

Acronyms

Air Quality Improvement Program (AQIP)
Air Quality Management District (AQMD)
Air Resources Board (ARB)
Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP)
American Society for Testing and Materials (ASTM)
Anhydrous ammonia (NH₃)
California Code of Regulations (CCR)
California Environmental Quality Act (CEQA)
Carbon dioxide (CO₂)
Carbon monoxide (CO)
Emission Reduction Credits (ERC)
Environmental Impact Report (EIR)
Environmental justice (EJ)
Greenhouse gas (GHG)
Greenhouse gases, Regulated Emissions, and Energy Use in Transportation (GREET)
Fiscal year (FY)
Localized health impact (LHI)
New Source Review (NSR)
Nitrogen oxide / oxides of nitrogen (NO_x)
Particulate matter (PM)
Reactive organic gas (ROG)
Sulfur oxide (SO_x)
Tons per day (TPD)
Tons per year (TPY)
Ultra low sulfur diesel (ULSD)
United States Environmental Protection Agency (U.S. EPA)
Volatile Organic Compound (VOC)